Putting the Pandemic in Context: Major Milestones, Challenges, and Policies, 2020–2022

The task force recognizes that this report will be used by different people across North Carolina for a variety of purposes and goals. Policymakers, organization leaders, and practitioners will consult these pages for context as well as for concrete actions to improve our state's resilience, preparation, and emergency response. Community members, employers, and other private sector leaders will use the background information and stakeholder perspectives in this report to inform the development of new or continued partnerships. Partnerships across these stakeholders and with government agencies will allow communities to better prepare neighborhoods, economic sectors, and other entities for the economic and social shocks of a future pandemic. Researchers, advocates, and scholars of public policy may focus on the policy recommendations in this report to assess the impacts of existing policies and identify gaps that need urgent attention.

The needs of one specific additional audience, posterity, also deserve our consideration. Future North Carolinians may, in calmer times, use this report to better understand the conditions and challenges of the COVID-19 pandemic and our collective successes and failures in addressing them. Should these future leaders also face the daunting task of responding to a rapidly spreading infectious disease, the lessons learned and documented in this report may provide guidance for their decisions and their work.

A definitive and comprehensive history of this period has yet to be written; that is not the aim of this report. This background chapter endeavors to provide sufficient context for understanding the conditions under which major policy and response decisions were made. With the benefit of additional hindsight, delineations between phases of the pandemic may become clearer.

For simplicity's sake, this background chapter uses calendar year 2020 to represent the initial phase of the pandemic, as it was a year that began with the first confirmed case in the United States (January 20, 2020)[1] and ended with the first vaccines offered to health care workers in North Carolina, in mid-December.[2] Calendar year 2021 roughly represents the intermediate phase of the pandemic. The year began intensely with a focus on mass vaccine distribution[3] and management of a surge of hospitalizations that deeply taxed acute care resources.[4] Late spring brought some reprieve with increased vaccination rates and an easing of some social distancing restrictions,[5] but the Delta variant caused a new surge of hospitalizations in the latter half of the year.[6] Calendar year 2022 roughly represents the phase of response "maturity," with continued spread of virus variants;[7] incremental gains and improvements in testing,[8] vaccination,[9,10] and treatment options;[11] and popular risk perception tilting toward the resumption of normal school, business, and social activities.[12]

For each of these phases, we summarize the major challenges and milestones, as well as political, social, and cultural conditions. We also provide an overview of major federal and state policy changes adopted. Additional details can be found in Appendix C: a series of issues briefs published by the NCIOM and IMPH in April 2020, May 2020, February 2021, and April 2021.

2020: Emergency of the Virus, Initial Response, Societal Trauma, and Vaccine Development

It is difficult to adequately convey the intense uncertainty of the initial weeks and months after the first United States case of COVID-19 was confirmed in the state of Washington in January 2020. Between January 21 and February 23, 14 cases of COVID-19 were confirmed in six states, in individuals who had traveled from China and their household contacts. At this point in the pandemic, health officials anticipated that the virus would spread rapidly across the country as it shifted from travel-related cases to transmission within communities. Their assumptions were correct; by April 21, there were 793,669 confirmed COVID-19 cases in the United States.[13] In these early days, officials lacked important understanding of elemental aspects of the virus's characteristics and likely impacts. While experts expected that COVID-19 could manifest similarly to other coronaviruses, specific aspects of transmission were unknown and untested, such as whether it was spread through droplets from coughs and sneezes or through airborne transmission, and whether it lived long enough on surfaces to spread through touch. Whether and how a vaccine could be developed, and how long that process would take, was also unknown.[14] Physicians and researchers began to identify how the virus was transmitted and sickened people, observed patterns of disease trajectory, and shared theories of possible comorbidities that contributed to disease severity, as well as possible treatments and techniques to provide symptom relief. In the absence of full knowledge and without effective medical strategies for treatment and prevention, federal and state officials took unprecedented steps to implement exposure-limiting strategies, such as minimizing travel (especially for foreign nationals into the United States and between states in some cases), limiting large gatherings, and closing schools and some workplaces.[15,16,17] On March 14, 2020, Governor Cooper issued Executive Order 117, which closed all public schools for at least two weeks and prohibited gatherings of 100 people or more.[18] Many public schools in North Carolina remained closed through the rest of the school year and reopened in the fall of 2020 with most or all students attending remotely.[19]

It quickly became clear that these exposure-limiting strategies imposed unequal burdens and would be unsustainable for some (such as people with limited incomes and savings to allow them to remain home from work) and impossible for those whose work could not be performed remotely, such as health care workers, transit employees, and many other frontline essential workers. In addition to these challenges, access to COVID-19 tests was extremely limited and global demand for personal protective equipment (PPE) had increased so rapidly that many health care providers had to develop new partnerships with local manufacturers (many of whom had never before produced medical PPE) for assistance in procuring sufficient stock.[20, 21, 22] Health systems, hospitals, and settings such as long-term care facilities took measures to prevent staff exposures and preserve supplies and equipment, such as cancelling elective and non-urgent procedures and strictly limiting visitors.[23, 24] Anticipating a surge in cases that could exceed capacity for acute care beds, staff, and equipment, the NCIOM, in partnership with the North Carolina Medical Society and the North Carolina Healthcare Association, convened stakeholders in late March and early April to provide recommendations to the North Carolina Department of Health and Human Services (NCDHHS) for the *North Carolina Protocol for Allocating Scarce Inpatient Critical Care Resources in a Pandemic*.[25] Long-term care facilities were especially hard hit in these early months; by May 2020, over 2,500 cases had been confirmed in nursing homes in North Carolina, accounting for 350 deaths.[26]

Amid these challenges, our state was achieving important milestones. COVID-19 testing, which had previously only been available through the CDC, state labs, and inpatient hospital labs to patients who met strict criteria, became more widely available. These tests became an important tool for people to know their status and manage their risk, as well as for developing effective mitigation strategies, including contact tracing, quarantine, and isolation guidelines. In late February, the FDA published its COVID-19 testing guidance for clinical laboratories, and throughout the spring, testing became available for the general public through local health departments, health systems, retail pharmacies, and clinics. Specimen collection was often performed in large-scale, drive-through formats[27,28] and through mobile units sent to locations that were underserved by existing health care facilities, and/or were in areas of elevated risk of exposure and severe illness. [29, 30]

March 25, 2020, brought the sad but expected news of the first confirmed deaths due to COVID-19[31] in North Carolina. In addition, in March 2020, the United States Congress passed three significant pieces of federal legislation to address the pandemic: the Coronavirus Preparedness and Response Supplemental Appropriations Act (March 6), the Families First Coronavirus Response Act (March 18), and the Coronavirus Aid, Relief, and Economic Security (CARES) Act (March 27). The appropriations act provided funds for response and preparedness activities at the state and local level (such as epidemiology, laboratory capacity, and communications), as well as funding to federal institutes to research and develop vaccines, therapeutic measures, and diagnostics.[32] The Families First Coronavirus Response Act provided up to 80 hours of paid sick leave for employees without that benefit, mandated that health insurers provide coverage for COVID-19 diagnostic testing, lifted work requirements associated with food assistance benefits through the SNAP program, and increased unemployment assistance to states.[33, 34, 35, 36]

The CARES Act included $2.5 trillion in federal spending on the first round of direct stimulus payments to individuals, loans for businesses (including the Paycheck Protection Program), and funding for hospitals, health care providers and independent physician practices, community health centers, and state and local governments.[37] **Table 1** includes additional details on CARES Act funding.

Throughout the late summer and fall of 2020, acute care providers prepared for a seasonal surge in cases and worked tirelessly to care for large numbers of ill patients.[38] Also during this time, public health authorities worked to expand access to testing and prepare for mass distribution of vaccine, pending federal authorization based on its safety and effectiveness. In November, important achievements in treatment and vaccine development were announced. The United States Food and Drug Administration (FDA) issued the first Emergency Use Authorization (EUA) for monoclonal antibody treatment and Moderna and Pfizer reported their vaccines to be 94.5% and 95% effective, respectively, in their large-scale clinical trials.[39] North Carolina policymakers began the process of developing the state's vaccine allocation strategy, based on providing vaccinations to those at higher risk of contracting the virus and to those at higher risk of severe disease, with a focus on building on community strengths to develop equitable vaccination access strategies. On December 14, North Carolina received 85,800 doses of vaccine and began immunizing health care workers.[40] In the final months of 2020, hospitals were filling up. By year's end, almost 580,000 positive cases in North Carolina had been confirmed through laboratory testing and the deaths of over 8,000 North Carolinians were attributed to COVID -19.[41]

Events of 2020: Additional Federal and State Context

These challenges and achievements were taking place within a time of deep political, social, and cultural change in the United States. We will not do these circumstances justice here, but briefly mention four key issues that both influenced and were influenced by the pandemic: the 2020 presidential campaign, anti-Asian bias, renewed calls for policing reform and racial justice after the deaths of Ahmaud Arbery, Breonna Taylor, and George Floyd, and transformational changes in the workforce and working conditions.

Table 1. Funding Details in the Coronavirus Aid, Relief, and Economic Security Act and Estimated Beneficiaries in North Carolina

STIMULUS PAYMENTS TO INDIVIDUALS AND FAMILIES	ESTIMATED* % OF HOUSEHOLDS THAT WILL RECEIVE A PAYMENT
• One-time payments of up to $1,200 per adult, $500 per child under 17 • Eligible individuals include all U.S. residents with a Social Security Number who are not claimed as a dependent for tax purposes • Payments calculated using 2019 tax return, or 2018 if not yet filed • Payments will be directly deposited if deposit information avaliable from tax return, otherwise checks will be mailed out beginning around April 17 • Individuals earning $75,000 or less annually (adjusted gross income) will receive $1,200; payments decrease with increasing income and are phased out at $99,000 annually • Individuals filing taxes as "head of household" (usually single parents with children) will receive $500 per child under 17 and are eligible for the full amount if their earnings are $112,500 or less; individual payments are phased out at $136,500 annually; for each additional $10,000 of earnings over $136,500, payment for children will decrease by $500 (e.g., head of household earning $156,600 with two children will not receive payment, but would receive $500 if they had three children) • Married couples earning $150,000 or less annually will receive $2,400; payments are phased out at $198,000 annually • Married couples with children receive $500 per child under 17; for each additional $10,000 of earnings over $198,000, payment for children will decrease by $500 (e.g., married couples earning $218,000 with two children will not receive a payment, but would receive $500 if they had three children)	83% of married parents 94% of single parents 99% of individuals who are single and living with others (no children) 89% of individuals living alone
PANDEMIC UNEMPLOYMENT ASSISTANCE	**STATE UNEMPLOYMENT DETAILS**
• Expands unemployment benefits 13 weeks beyond what states provide • Temporary supplement of $600 per week to unemployment benefits provided by state for four months • Eligible individuals include those who worked part-time, were self-employed, and/or were gig economy workers, if allowed by the state • Furloughed employees can qualify even if still receiving benefits from employer • Federal government will pay first week of benefits if state waives one-week waiting period	New unemployment claims last two weeks of March: 305,804 State unemployment benefits: $350 max weekly; $265 avg. weekly Current recipiency rate***:10% One-week waiting period waived?: Yes
AID TO STATE AND LOCAL GOVERNMENTS = $150 BILLION	**AMOUNT ALLOCATED TO EACH STATE (LOCAL CAP**) $ IN MILLIONS**
• Use for COVID-19-related expenses incurred between March 1, 2020, and December 30, 2020, that are not accounted for in state budgets • 45% of state funds allocated for local governments for areas with populations of 500,000 or more • $8 billion of these funds set aside for tribal governments	$4,067 ($1,830)
LOANS TO SMALL BUSINESSES = $350 BILLION	**ESTIMATED NUMBER OF QUALIFYING BUSINESSES AND EMPLOYEES^**
• Companies with 500 employees or fewer • Up to eight weeks of cash-flow assistance to maintain payroll • If payroll maintained, any funds used for payroll costs, interest on mortgage, rent, or utilities will be forgiven • Loans available retroactively to February 15, 2020, and up to June 30, 2020 • Maximum loan amound based on formula (average monthly payroll x 2.5); maximum loan size $10 million • Applications must be submitted online, available through the US Department of Treasurey website • Also available, Economic Injury Disaster Loans with $10,000 advance	Establishments with 1 to 499 employees: 226,766 Individuals employed by these establishments: 2.98 million
PUBLIC HEALTH AND SOCIAL SERVICES EMERGENCY FUND = $127 BILLION	
• $100 billion intended to "reimburse, through grants or other mechanisms, eligible health care providers for health care related expenses or lost revenues that are attributable to coronavirus" • Hospitals can apply for funding for a variety of COVID-19-related expenses (e.g., construction of temporary structures, medical supplies) • Distribution at the discretion of Secretary of the US Department of Health and Human Services • There are no formulas, eligibility criteria, or requirements for specific geographic distribution • Hospitals will receive a 20% increase in Medicare reimbursement for expenses related to COVID-19 • Scheduled reductions in Disproportionate Share Hospital payments delayed until December 2020 • $27 billion for developing vaccines and purchasing supplies; $16 billion must be allocated to purchases from the Strategic National Stockpile	

Source: North Carolina Institute of Medicine and South Carolina Institute of Medicine and Public Health. Issue Brief: COVID-19 and the Carolinas State Responses and Federal Legislation to Address the Crisis. April 2020. https://nciom.org/wp-content/uploads/2020/04/COVID-Brief_final2.pdf Accessed July 14, 2022.

Table 1. Continued on next page

Continued **Table 1. Funding Details in the Coronavirus Aid, Relief, and Economic Security Act and Estimated Beneficiaries in North Carolina**

LOANS TO LARGE CORPORATIONS = $500 BILLION

- Provided for loans, loan guarantees, and other investments; for up to five years and not forgiven
- Program will be overseen by an inspector general at the Treasury Department
- Specific payments allocated to airlines ($50 billion) and cargo carriers ($8 billion)
- Prohibitions on businesses owned by U.S. President, Vice President, members of Congress, and heads of Executive Departments benefiting

OTHER SELECT APPROPRIATIONS

- COVID-19 testing and vaccines to be provided at no cost to patients
- $1 billion for Indian Health Service for support of medical services, equipment, and supplies
- $1.3 billion for emergency funding of community health centers
- $19.6 billion for Department of Veterans Affairs equipment, testing, and support services
- $1.5 billion for Economic Development Administration to assist communities with economic revitalization after pandemic
- $5 billion to the Community Development Block Grant program to help states and localities respond to COVID-19-related economic and housing impacts (e.g., expanding community health centers, child care, food banks, and senior services)
- $45 billion for Disaster Relief Fund for state and local needs related to the pandemic (e.g., National Guard deployment, personal protective equipment, medical response)
- $30.75 billion Educational Stabilization Fund for states to use for elementary, secondary, and higher education; allocations to states based on formulas^^
- Agriculture-related funding, including $14 billion for Commodity Credity Corporation and $9.5 billion for additional assistance to livestock and specialty crop farmers
- Suspension of federal student loan playments to September 30 with no accrued interest; applies to loans made within past 10 years

**Estimates based on Cecil G. Sheps Center for Health Services research analysis of 2014-2018 American Community Survey (ACS) 5-Year Public Use Microdata Sample (PUMS) Files; U.S. Census Bureau (2020); retrieved from https://www2.census.gov/programs-surveys/acs/data/pums/2018/5-Year/. Assumptions used for estimates: Individuals and couples have filed a tax return in 2018 or 2019; married couples file jointly; individuals who are single may be overestimated due to inclusion of all adults 18 and older without knowledge of dependency status for tax purposes.*

***Local cap refers to the maximum amount a local government can be given from the total state allocation.*

**** Recipiency rate refers to the percent of people applying for unemployment benefits who receive them. North Carolina has the lowest recipiency rate in the country. The US average is 28%. (United States Department of Labor. Recipiency Rates, By State. 2019. https://oui.doleta.gov/unemploy/Chartbook/a13.asp)*

^ Calculations from American Community Survey.2016 Business patterns. CB1600A12: Geography Area Series: County Business Patterns by Legal Form of Organization. North Carolina and South Carolina.

^^ The Center for Budget and Policy Priorities has estimated the amount states will receive from the Education Stabilization Fund and projects that North Carolina will receive $831.6 million ($378.4 million for K-12 schools, $357.6 million for higher education, and $95.6 million for Governors' emergency education relief grants) and South Carolina will receive $410.2 million ($204.0 million, $159.0 million, and $47.3 million, respectively). https://www.cbpp.org/research/state-budget-and-tax/how-much-will-states-receive-throughthe-education-stabilization-fund

In June 2020, Joseph Biden, Jr., secured the Democratic Party nomination for President; the race between Biden and incumbent President Donald Trump played out amid a vastly changed campaign environment that included modifications to election processes to allow for socially distanced voting.[42] Changes to North Carolina election rules included requiring one witness signature (rather than two) on mail-in ballots, submitting mail-in ballot request forms by email or fax, and an online ballot tracking system; this latter change remains in effect but other provisions have reverted back for the 2022 election cycle.[43] Biden's and Trump's distinct approaches to large gatherings and rallies reflected their vastly different approaches to the pandemic, with Trump endorsing return-to-normal activities and reticence regarding masking in public and other public health directives, while Biden's campaign emphasized social distancing[44] and virtual events.

President Trump's time in the White House was uniquely polarizing among American voters, as reflected in opinion polls, voter mobilization, and the close election results in North Carolina. Gallup reported that an average of 88% of Republicans approved of the job Trump was doing during his presidency, while only 7% of Democrats approved,[45] a record-setting divide in Republican-Democrat approval of a sitting president. Trump's 1.3% margin of victory over Biden in North Carolina was an indication of the tight nature of this race in a hard-fought state. The 2020 election had North Carolina's highest voter turnout ever, with over 1 million votes cast absentee-by-mail.[46]

Within this polarized and extraordinarily stressed environment, issues of racial and ethnic inequity and discrimination were prominent throughout the pandemic. Two developments during this initial phase of the pandemic—anti-Asian bias and police-involved deaths of Black Americans—are particularly important to understand because of their relevance to health inequities before and during the pandemic. Early national and state data on COVID-19 indicated deep racial disparities in both infection rates and deaths. For example, while Black or African American residents constitute 22% of the North Carolina population, they accounted for 27% of confirmed COVID-19 cases and 33% of deaths from March 2020 through June 9, 2020. People of Hispanic ethnicity comprise almost 10% of the state's population, but represented 42% of COVID-19 cases during that same period. White residents were underrepresented in both confirmed cases and deaths from March through the end of May 2020. White North Carolinians make up about 61% of the state's population, but accounted for only 43% of cases and 44% of deaths during these first three months of the pandemic,[47, 48] according to publicly available data.

While North Carolinians identifying as Asian (3.3%) were underrepresented in cases (2.7%) and deaths (<1%) during this time period, across the country, reports of violence, discrimination, and hate speech against Asians and Asian Americans rose precipitously, as many blamed China for the pandemic and directed vitriol against Asian people of all backgrounds.[49] The increase in racist incidents in North Carolina prompted a special message in late March from University of North Carolina at Chapel Hill Chancellor Kevin M. Guskiewicz and other campus leaders, as well as an initiative from North Carolina Asian Americans Together to document incidents of discrimination.[50,51] A national study of anti-Asian messages on Twitter from November 1, 2019, through May 15, 2020, identified a large section of North and South Carolina as one of 15 geographic clusters in the country with an elevated and statistically significant rate of anti-Asian tweets.[52] This study also identified two national spikes in anti-Asian tweets during this time period: at the end of January with the first confirmed case of COVID-19 in the United States, and after President Trump tweeted about the "Wuhan flu" and "Chinese virus" in mid-March.

The early months of the pandemic were also marked by repeated incidents of law enforcement-involved deaths of Black people. On February 23, 2020, 25-year-old Ahmaud Arbery was jogging in the neighborhood of Satilla Shores, Georgia, when he was pursued by three men, one of whom shot and killed Arbery after an exchange of words and brief physical confrontation. One of the three, Gregory McMichael, had served as both a police officer in the county and an investigator in the District Attorney's office; no arrests were made at the time of Arbery's death and charges were first filed after bystander video emerged months later, in May 2020.[53] After midnight on March 13, 2020, in Louisville, Kentucky, police used a battering ram to enter medical worker Breonna Taylor's apartment in search of evidence related to a former associate of Taylor's; she was shot multiple times and died on the scene.[54] On May 25, 2020, George Floyd was detained by four police officers in Minneapolis and died in the street after officer Derek Chauvin pressed his knee into Floyd's neck for approximately nine minutes. Each of these cases led to charges against the officers (and former officers) involved. The defendants in Ahmaud Arbery's trial were convicted of felony murder, aggravated assault, and false imprisonment in November 2021, and of federal hate crimes in August 2022.[55] Also in August 2022, the United States Department of Justice announced charges against four police officers involved in the death of Breonna Taylor; to date, one former detective has pleaded guilty to falsifying information to obtain the search warrant of her home.[56,57] Chauvin was convicted of the murder of George Floyd in April 2021.[58]

These and other incidents led to protests across the country and inspired prominent displays and messages from political figures, organizations, and corporations expressing support for changes to combat systemic racism and achieve racial equity in the United States.[59] The impacts of these events on the nation and on the pandemic are far too complex to adequately address here, but some effects of racialized stress and violence on the health of historically marginalized populations are known. Multiple studies indicate the differential traumatic impact of witnessing violent incidents of systemic racism,[60,61,62] with Black individuals reporting far more sadness, anger, depression, and other forms of poor mental health than other racial groups.

These tragic events also spurred leaders to more transparently discuss and attempt to address the effects of systemic racism on pandemic-related outcomes, as well as to develop initiatives to promote equity. For example, in June 2020, Governor Cooper issued Executive Order 143 to address multiple disparities—social, economic, and environmental—in communities of color that have exacerbated health disparities in the pandemic.[63] Also in June, NCDHHS announced grants to five local organizations to address the disproportionate impact of COVID-19 among the state's Hispanic communities.[64] NCDHHS also prioritized the collection and reporting of data disaggregated by race and ethnicity throughout the pandemic, allowing researchers, public health workers, and others involved in the COVID-19 response to gain a better understanding of the disparate impacts of the pandemic and develop strategies for alleviating these impacts and addressing issues of health equity.

Against this backdrop, North Carolinians were also experiencing fundamental changes in their working lives. Stay-at-home orders and social-distancing measures issued in the early weeks of the pandemic had immediate economic impacts, especially to restaurants, hotels, providers of personal care services, and small business and retailers. In the final two weeks of March 2020, new unemployment claims passed 300,000—far more claims than would typically be filed annually.[65,66,67] According to the Quarterly Census of Employment and Wages, North Carolina businesses reported 500,000 fewer jobs in April 2020 than in the previous month, with the largest percentage drops in Dare, Alexander, Watauga, Yadkin, and Buncombe counties.[68] This translated into loss of health insurance for many North Carolinians whose coverage was tied to employment; an estimated 257,000 North Carolinians lost coverage in the first six months of the pandemic.[69] Women's employment swung dramatically in the early months of the pandemic: while it fell 17.3% in May 2020 (versus 10% for men), women's employment improved substantially by the next month and gained steadily, outperforming national rates for women's participation in the labor force and surpassing pre-pandemic levels late in 2021.[70] Those who remained in the workforce in 2020 faced either a higher risk of exposure[71] to infected individuals if their positions required in-person work, or adaptation to the new environment of remote work, sometimes while also caring for children who were at home due to school closures. A Pew Research Center study conducted in October 2020 examined workforce trends due to the pandemic, finding a clear economic and educational

divide in the transition to remote work. While 62% of Americans with a bachelor's degree or more reported that their work could be done from home, only 23% of those without a four-year degree reported the same. A clear majority of high-income employees (56%) reported being able to fulfill their work responsibilities from home, while most middle- (63%) and low-income (76%) workers could not. Of those who did report being able to fulfill their work responsibilities from home, over 70% were working remotely and 54% reported a desire to continue doing so after the end of the pandemic .[72] As we now know, hastily planned transitions to remote work for a large segment of the population in spring 2020 have shifted from temporary pandemic measures to becoming established as preferred modes of working, with more organizations adopting fully remote and hybrid arrangements .[73]

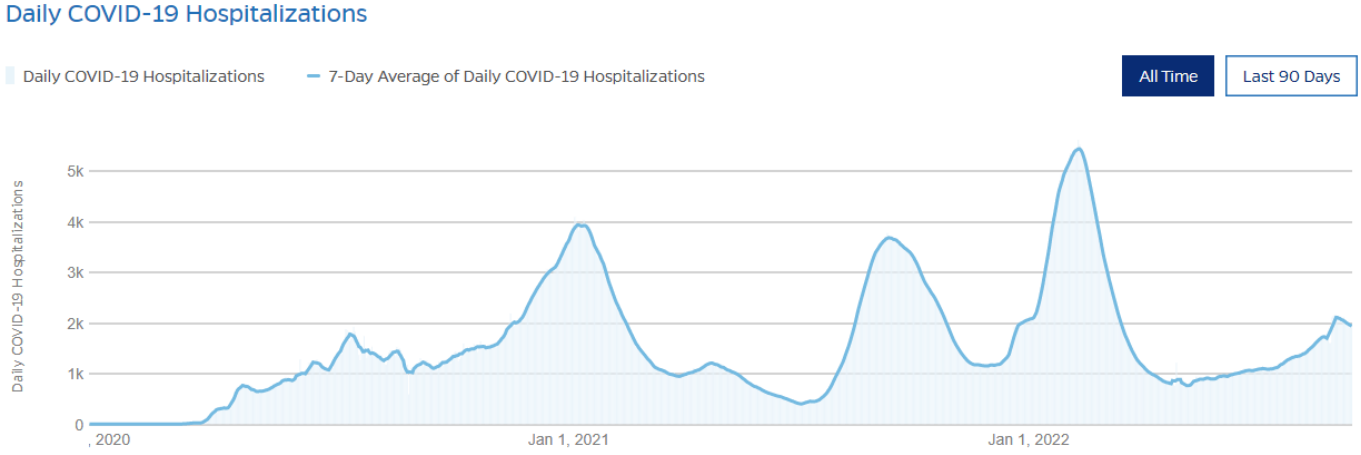
By the end of 2020, Americans had spent months coping with the concerns of not only a deadly global pandemic but also a divisive presidential campaign; an unprecedented array of isolating and disorienting changes to work, school, and personal lives; experiencing and/or witnessing vivid examples of violence and discrimination based on race and ethnicity; and growing fears of overwhelming the capacity of our health care system to manage large surges in demand for medical care.

2021: Mass Vaccine Distribution, Hospital Surges, Political Polarization, and Mental Health Challenges

January 2021 began with both deeply distressing and markedly hopeful developments. Controversy over the results of the presidential election reached a boiling point on January 6, 2021, when supporters of President Trump organized large protests in Washington D.C. and several thousand joined a violent attack on the United States Capitol. These actions succeeded in delaying certification of the election results until later that evening, and the violence of the event—during which legislators were urgently evacuated and lives were lost—brought condemnation from members of both political parties.[74] As this turmoil unfolded in Washington D.C., North Carolina hospitals were feeling a different kind of stress while caring for 4,079 people hospitalized with COVID-19, the highest number to that point (**Figure 1**). Health systems struggled to find sufficient staffing, with many of their employees out of work due to their own COVID-19 illness or that of a family member.[75] However, 100,000 health care workers had received first doses of COVID-19 vaccine by early January, and the next steps for broader vaccine distribution were beginning to take hold across the state.

Priorities in emergency response of any type include saving lives, preventing injuries and illness, and preserving critical community infrastructure, such as hospitals. In the first weeks of 2021, as cases, hospitalizations, and deaths rose dramatically, these critical priorities were the focus of response efforts at local, regional, and state levels. With the virus spreading rapidly, Governor Cooper extended his modified stay-at-home order, requiring people to stay at home from 10PM to 5AM, and then North Carolina Secretary

Figure 1: Hospitalizations in North Carolina



Data Sources: Cases and deaths data from JHU CSSE; testing and vaccine data from JHU CCI; and hospitalization data from the U.S. Department of Health and Human Services.

Source: Johns Hopkins Coronavirus Resource Center. North Carolina - COVID-19 Overview. Accessed August 31, 2022. https://coronavirus.jhu.edu/region/us/north-carolina

of Health and Human Services Mandy K. Cohen issued a special Secretarial Directive advising North Carolinians to stay home and avoid gathering with anyone living outside their homes.[76,77] In addition, on January 11, 2021, NCDHHS adopted the *North Carolina Protocol for Allocating Scarce Inpatient Resources in a Pandemic*. This protocol's purpose was to "provide recommendations for the triage of all adult inpatients in the event that a pandemic creates demand for critical care resources (e.g., ventilators, critical care beds) that outstrips the supply."[8]

As acute care leaders across the state coped with the overwhelming demand for hospital care, providers began distribution of vaccine to priority groups. With North Carolina receiving only about 120,000 doses of vaccine weekly during January, in early 2021 demand for vaccine far exceeded supply. North Carolina's winter and spring 2021 vaccine distribution began with health care workers and residents of long-term care facilities, then moved on to people aged 65 and older (after January 14), frontline essential workers[79,80] (child care and PreK–12 teachers on February 24, other frontline workers beginning March 3), people aged 16–64 with underlying health conditions[3,80,76] (beginning March 17), and all adults (beginning April 7). Local health departments led distribution in the initial weeks, joined later by collaborative efforts between health systems, contractors, volunteers, and federal personnel, repurposing large conference facilities, empty warehouse spaces, shopping malls, and even sporting facilities, such as the Charlotte Motor Speedway and Bank of America Stadium, to "get shots in arms" efficiently, effectively, and equitably .[81,82] During this time, there were broadly varied opinions and attitudes about the vaccinations; many people of color, in particular, worried about the vaccine's safety due to mistrust of health care systems because of systemic mistreatment. Others worried about whether the vaccine had been adequately tested, or were concerned about whether they would be required by employers or others to receive the vaccine .[83]

Initiatives to expand testing and vaccination, as well as to address individuals' and communities' concerns with the vaccine, began to bear fruit. Over the course of late winter and early spring of 2021, cases, deaths, and hospitalizations dropped dramatically. By March, case rates in long-term care facilities had fallen 15-fold from the peak of transmission in January 2021, and most facilities were cleared to resume in-person visitation.[84] On March 11, 2021, Governor Cooper signed a law requiring all K–12 public schools to offer the option of in-person learning by April 1.[85] Indoor occupancy allowances for businesses and gatherings increased; the statewide indoor mask mandate remained in effect until May 14.[16,15,86,17,87] In mid-summer (June 19, 2021), weekly cases and hospitalizations were at 2,647 and 458, respectively (numbers that resembled those of the earliest months of the pandemic in 2020).[41,88] Social-distancing restrictions were eased to reflect improvements in the rates of COVID-19 and to balance vigilance against further spread with the widely held goals of reducing the impact of these restrictions on economic activity, children's learning, and social well-being.

In March 2021, the United States Congress passed the American Rescue Plan Act (ARPA), which provided $1.9 billion intended to support families, stimulate the economy, and combat the pandemic. For individuals and households, ARPA funds provided another round of direct stimulus payments to individuals, made changes to the Child Tax Credit and Earned Income Tax Credit to benefit families with children and low-income households, extended the timeline for the $300-per-week federal benefit for Pandemic Unemployment Insurance, and increased subsidies for Affordable Care Act Marketplace plan premiums. ARPA provided funds to local and state governments for infrastructure investments (economic development, water, sewer, and broadband), health and human services (both pandemic response and other services, especially for medical safety net providers, housing, food assistance, child care, and behavioral health services), and education (to support costs of reopening schools). The Paycheck Protection Program was funded through ARPA (although at a lower amount than previously), and ARPA included provisions for small business support through a combination of loans and targeted relief. **Table 2** provides details of direct aid provided to North Carolina through ARPA.

Table 2 : Direct Aid to North Carolina from the American Rescue Plan Act

State Aid	$5,196,748,534
Local Aid	$3,783,654,988
Number of Carolinians Receiving Stimulus Checks	89% of adults (6,582,400) 89% of children (2,693,100)
Capital Projects	$277,000,000
Elementary and Secondary School Emergency Relief (ESSER) Fund	$3,599,191,706
COVID Testing and Help with Reopening	$315,895,947
Expanded Child Care Assistance	$503,793,710
Emergency Rental Assistance	$556,000,000
Child Care Stabilization Fund	$805,767,458
Estimated SNAP Participants	1,430,000
Estimated SNAP Benefit Increase per Person	$28

Source: North Carolina Institute of Medicine and South Carolina Institute of Medicine and Public Health. Issue Brief: COVID-19 and the Carolinas Part IV: State Responses and Federal Legislation to Address the Crisis. April 2021. https://nciom.org/wp-content/uploads/2021/04/COVID-and-the-Carolinas-Part-IV_Final.pdf Accessed September 4, 2022.

While spring and early summer of 2021 brought welcome relief from the stress of peak case rates, people were still managing a multitude of stressors over a year into the pandemic. Reports on the behavioral health effects of the pandemic demonstrate the extent to which individuals and families struggled to cope effectively. A nationally representative survey of high school students (grades 9–12) conducted from January through June of 2021 found that 37% of adolescents reported poor mental health during the pandemic, with almost 20% seriously considering suicide and 10% reporting having attempted suicide.[89] A survey of more than 26,000 local, state, territorial, and tribal public health workers conducted from March 29 through April 16, 2021, found that more than half (59.2%) of the survey respondents typically worked 41 or more hours weekly, and more than half (52.8%) reported experiencing symptoms of one or more mental health conditions in the prior two weeks, including depression (30.8%), anxiety (30.3%), PTSD (36.8%), or suicidal ideation (8.4 %).[90]

Health care workers struggled with long days and continued high demand for their services, especially as fall 2021 brought a new surge of cases and hospitalizations due to the Delta variant. While the early months of the pandemic were marked by a surge of support for health care workers, with meals, gifts, and gestures of support flowing abundantly, many workers felt a change in this support as the pandemic continued.

WakeMed (Raleigh, NC) pulmonologist David Kirk summed up the vast changes in perception and support of health care workers in the second year of the pandemic: "Last year, everyone had a single vision that we as a society are all going to rally together and beat COVID. It's not that way now. Nobody's donating food. Nobody's sending kind words. It's not that our teams necessarily need that praise all the time. But I just think it's incredibly hard for our staff to continue to battle day after day after day and to feel that society and our community around us doesn't understand what's going on."[91]

Representing another grim metric of the toll of the pandemic on behavioral health, between 2019 and 2020, North Carolina saw a 40% increase in overdose deaths. In 2018 and 2019, there were 2,302 and 2,352 total drug overdose deaths in North Carolina, respectively, a metric that the state was hoping would hold steady or decrease through efforts like the Opioid Action Plan. However, heightened stressors and changes in access to preventive services, harm reduction strategies, and treatment during the pandemic were associated with a dramatic increase in overdose deaths in 2020 (3,304), a number that grew again in 2021 to 3,759.[92]

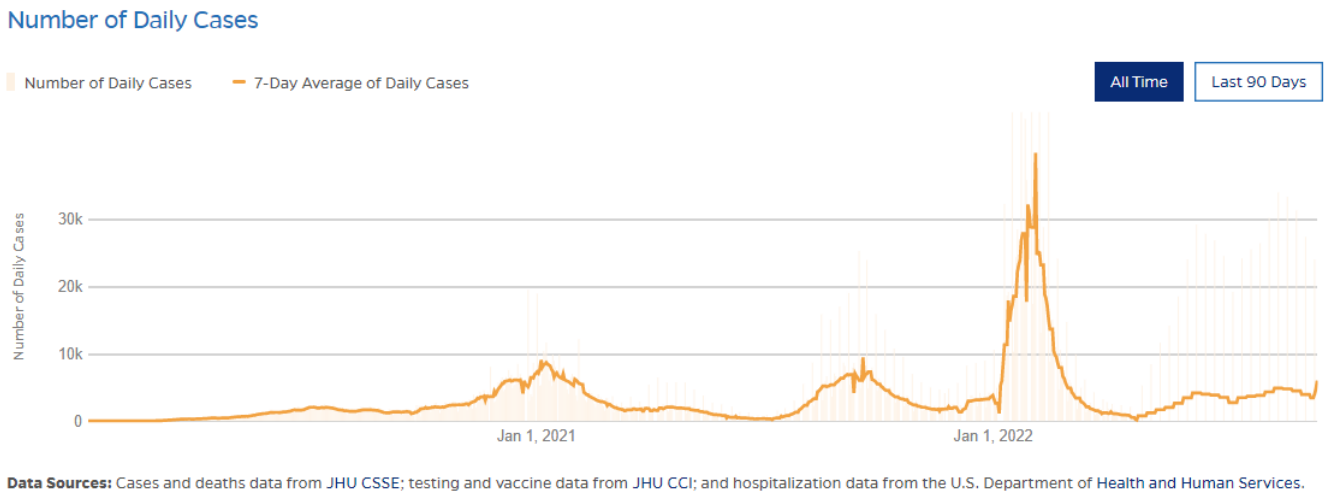
While the early months of 2021 were marked by high demand for vaccine distribution, and the distribution was limited to prioritized groups, by April 7 anyone aged 16 and older who wanted a vaccine could get one, and vaccines for children aged 12 and older became available on May 12.[t] NCDHHS conducted public opinion research in November 2020 and March 2021 to better understand North Carolinians' perceptions and motivations regarding COVID-19 vaccination, finding that by March 2021 public views of the vaccine had grown more positive, perception of risk had decreased significantly, and the majority of residents (almost 7 in 10) had already gotten the vaccine or planned to do so.[93] In April 2021, the Duke-Margolis Center for Health Policy and the National Governors Association released a report on model practices to achieve vaccine health equity, highlighting the following practices implemented in North Carolina:[94]

- Increasing supply allotments to counties with a larger share of historically marginalized populations (HMP) and providers who demonstrate a track record of serving these groups.
- Providing weekly equity data reports to providers to document achievement toward equity goals.
- Extensive partnerships with community-based organizations and community health workers for outreach and special vaccination events conducted in partnership with trusted community leaders.
- Allocating $2.5 million to offset the costs of providing free public transportation to vaccination sites.
- Requiring all providers to collect and report race and ethnicity data for vaccinations, and publishing these data weekly on the state dashboard.
- Providing clear guidance to not turn away people due to lack of identification.
- Establishing a state-level team charged with monitoring vaccination data.

While the majority of adult North Carolinians chose to get vaccinated, and North Carolina celebrities from NASCAR star Richard Petty to then Duke and UNC basketball coaches Mike Krzyzewski and Roy Williams visibly demonstrated their support for the vaccines, others remained deeply wary of vaccine efficacy and safety.[95,96] For some, this skepticism persisted well beyond normal, healthy questioning of something new and reached a level described by former North Carolina state epidemiologist (2002–2009) and health director (2009–2012) Jeffrey Engel as, "like nothing I've ever seen, because it seems to obviously have taken advantage of the major political divisions that we're seeing in the United States today."[97] False information about COVID-19 treatments, masks, and vaccines was widespread on various social media platforms, despite efforts by sites like Facebook, Twitter, and YouTube to curtail it.[98,99] A March 2021 report from the Center for Countering Digital Hate titled, "The Disinformation Dozen: Why Platforms Must Act on Twelve Leading Online Anti-Vaxxers," found that 65% of the anti-vaccination content stemmed from 12 leading promoters of false information (including a physician based in Charlotte), and that their collective followers had grown to 59 million.[100]

In July of 2021, cases of COVID-19 began to rise due to the spread of the Delta variant, a form of COVID -19 that caused those infected to produce more virus in their bodies and remain contagious for longer than with earlier strains.[101] The number of daily cases rose from 864 on June 28 to 2,633 on July 28, reaching a peak on September 10, 2021, of 5,877 cases (**see Figure 2**). Hospitalizations in the Delta-variant-fueled surge peaked on September 2 at 3,764, less than the January 2021 peak of 4,015 but nonetheless very taxing to a health care system working through its second wave of cases within less than a calendar year. However, this wave was different for several reasons. Many (but not all) people who were vaccinated were protected from infection, and typically developed milder cases if they were infected. Unvaccinated people were much more vulnerable to becoming infected with the Delta variant, developing severe disease, and needing hospitalization.[102,103,104] Physicians also reported that their hospitalized patients, the vast majority of whom were unvaccinated, were younger adults in their 30s, 40s, and 50s.[91,105,106]

Figure 2: Cases in North Carolina



Data Sources: Cases and deaths data from JHU CSSE; testing and vaccine data from JHU CCI; and hospitalization data from the U.S. Department of Health and Human Services.

Source: Johns Hopkins Coronavirus Resource Center. North Carolina - COVID-19 Overview. Accessed August 31, 2022. https://coronavirus.jhu.edu/region/us/north-carolina[107]

A survey conducted in August 2021 by the North Carolina Nurses Association called attention to the high risk of burnout among nurses, their highly demanding working hours, vaccine controversies among their ranks—both in support of and in opposition to employer vaccine mandates—as well as "compassion fatigue" in caring for unvaccinated patients.[108] Respondents voiced frustration with the public's lack of adherence to preventive measures:

"The first year on [COVID-19] was really tough and we thought we were on the right track until everyone stopped wearing masks and vaccinations decreased. It's incredibly tough to treat these patients when we all know that this second round could have been prevented."

"In conversations with providers, we all agree that what we are experiencing now is significantly more frustrating than a year ago, as people now are just being intentionally obstinate, even as this virus is literally killing them."

"Being the only medical person in my family it is hard to explain what I'm feeling to others. I have family members that are still unvaccinated after all of the education I'm providing them. Seeing our ICU fill with unvaccinated or partially vaccinated patients is heartbreaking. I have turned in my [30-day] notice at the hospital and do not currently have another job lined up."

Masking policies generally continued to be divisive, and those who chose not to wear masks reported many varied reasons: nearly one-fifth of North Carolinians surveyed who reported not wearing masks said it was because they did not believe masks were effective in preventing transmission of COVID-19. More than 30% said it was inconvenient or uncomfortable. Other responses indicated the potential impact of mask requirements and community norms, with 17% saying they did not always wear a mask because "most people are not wearing masks" and 14% were "concerned what others will think of me or do to me if I wear a mask."[109]

The summertime rise in cases and hospitalizations of younger adults occurred at the same time that schools were preparing to begin a new year with in-person instruction. The excitement for this return to "normal" was tempered by concerns about the lack of child vaccine (it was not yet available to children under 12) and controversies (often falling along partisan lines) over requiring face masks to be worn in school.[110] As the first day of school approached, Governor Cooper declined to extend the mask mandate, but encouraged school leaders at the district level to maintain required masking in schools. Over the month of August 2021, as cases rose, 34 school districts voted to reverse earlier decisions to make masks optional and reinstate mask requirements; almost 80% of North Carolina school children were enrolled in a district that required face coverings at the start of the 2021–2022 school year, in red and blue counties alike. The remaining districts where masks remained optional rather than required were all in rural areas with predominantly Republican voting patterns.[110] While school boards made difficult decisions in contentious meetings over measures to prevent the spread of COVID-19 among schoolchildren, the North Carolina General Assembly passed a law requiring them to vote at least monthly on their face-covering policy.[111,112]

The second year of the COVID-19 pandemic was markedly different from the first. North Carolina made great strides in vaccine availability and equity, but professionals in public health and health care suffered high levels of work stress, mental health concerns, and a perception of a loss of support from and unity with the public. Despite the success of the vaccine in preventing severe illness from the very contagious Delta variant, the vaccines were also very polarizing. Differences in beliefs about the safety and efficacy of vaccines were societally divisive, and to some health care providers, deeply demoralizing. As 2021 came to a close, a post-Thanksgiving uptick in cases proved to be the beginning of the state's largest surge yet. North Carolina's first case of the Omicron variant was confirmed on December 10, and the year ended with a record-high number of 18,571 positive tests reported.[113]

2022: Gains in Testing, Vaccination, and Treatment; Economic Growth and Inflation; Adapting to Ongoing Illness in an Uncertain "New Normal"

The third year of the pandemic opened in a manner painfully similar to the first weeks of 2021, with rapidly rising cases and hospitalizations. The previous positive case record was quickly surpassed as the highly contagious Omicron variant spread rapidly, with an average of 29,000 new cases a day for the first three weeks of January, and a peak of 235,693 cases for week ending January 15, 2022.[41] Daily hospitalizations peaked during the week ending January 29, 2022, at 5,049, considerably higher than previous peaks of daily hospitalizations in the surges in January 2021 and September 2021.[114] However, the steep upward trend in cases also decreased quickly. On February 1, Governor Cooper announced the approval of a staffing support request made to FEMA to provide reinforcements to North Carolina hospitals managing record levels of patients.[115] But by February 17, Governor Cooper and Secretary of Health and Human Services Kody H. Kinsley were touting improved COVID-19 metrics and encouraging schools to drop mask mandates.[116] While cases and hospitalizations continued to drop through early April 2022, they have been on a slow increase since then; however, as of this writing in August 2022, rates remain far lower than in the 2021 and early 2022 surges. In August 2022, 286 individuals died from COVID-19-related illness in North Carolina in the four reported weeks of the month.[41] This stage of the pandemic is marked by the continued growth and advancement of response initiatives, with incremental gains and improvements building on the foundations of breakthrough advances in 2020 and 2021.

The first eight months of the third year of the pandemic brought gains in testing accessibility, vaccination, and treatment. Rapid tests for use at home became widely available in groceries, pharmacies, and convenience stores, providing a more accessible way for people to assess and manage their risk. The Biden Administration announced plans in January to purchase 1 billion at-home test kits and ship four free test kits per household.[117] In April, for the first time in its history, Medicare approved coverage of an over-the-counter test,[118] making it possible for Medicare beneficiaries to access up to eight free at-home COVID-19 tests per month. North Carolina health leaders continued to work to improve rates of vaccinations and boosters, and two major vaccine milestones were achieved in 2022. The CDC approved a vaccine for children aged six months to five years in June, meaning that everyone six months or older has access to an approved vaccine in the United States.[119] In August 2022, the FDA announced the first bivalent COVID-19 vaccine for people aged 12 and older; the bivalent vaccine will include the original vaccine as well as components intended to provide protection from recent Omicron subvariants.[120] However, rates of adult boosters and rates of child vaccination overall have been challenging to improve,[121] making some wonder whether people will opt for additional boosters even as vaccine technology advances.[122] Treatment options have also grown in 2022. There are two types of treatments for COVID-19—antiviral medications and monoclonal antibodies—and one medication authorized for pre-exposure prophylaxis for those at high risk.[123] Until 2022, both existing treatments—the antiviral remdesivir and the monoclonal antibody bebtelovimab—required intravenous administration. In 2022, two new antiviral medications (Paxlovid and Lagevrio) were emergency use authorized by the FDA and can be taken at home orally.[124]

While there has been tremendous progress in the development of vaccines and therapeutics to address COVID-19 since the virus first emerged, much remains unknown about the physiological trajectory of the virus in many individuals. Post-COVID-19 condition, known informally as "long COVID," is of increasing concern. This condition is defined as, "the condition that occurs in individuals with a history of probable or confirmed SARS-CoV-2 infection, usually 3 months from the onset of COVID-19, with symptoms that last for at least 2 months and cannot be explained by an alternative diagnosis."[125] Researchers estimate that among individuals who contract an initial COVID-19 infection, up to 80% may experience at least one long-term symptom. Long COVID symptoms vary, but generally include persistent fatigue, cognitive impairment, and neurological symptoms.[126] For some people, these symptoms have been severe enough to impact their ability to work or resume other usual activities. The full impact of long COVID on overall health outcomes, employment, and other indicators remains to be seen; however, it bears repeating that there is much still unknown about the overall physiological impact of infection over a lifespan.

Along with the physical health challenges of COVID-19, since 2020 the pandemic has catalyzed a host of mental and behavioral health challenges; leaders and experts in North Carolina have described the

prevalence of these issues among children and adolescents as constituting "the next wave of the pandemic."[127] In July 2022, Duke University psychiatrist Nathan Copeland described drastic changes to children's mental health in an interview with North Carolina Health News:

> **"We saw increased loneliness. Increased isolation. Increased parental distress. Increased substance abuse disorders across the entire population. The murder of George Floyd exacerbating racial trauma and highlighting the systemic racism that so many individuals experience. And we've just seen that temperature rise. We have seen a nearly two-fold increase in depressive symptoms and anxiety symptoms among children and adolescents. Nearly 20 percent of kids experiencing depression that's impairing them, nearly 25 percent of kids experiencing anxiety that's impairing them."**

The statistics for adult mental health are similarly concerning. In April 2020, the CDC and the United States Census began conducting a monthly online "pulse survey" to monitor changes in reported symptoms consistent with anxiety disorder and depressive disorder. August 2022 survey results suggested rates more than double those of the 2019 baseline rates of 8.1% (anxiety disorder), 6.5% (depressive disorder), and 10.8% (either anxiety or depressive disorder).[128] For North Carolina adults, 26.2% reported symptoms of anxiety disorder in August 2022; 20.8% reported symptoms of depressive disorder; and 29.7% reported symptoms of anxiety or depressive disorder.[129] This alarming report brings no surprises, and the recovery phase of this pandemic will require deep investments in mental and behavioral health care. It is also important to note that the COVID-19 pandemic has exacerbated the overdose crisis in North Carolina and across the United States, with more than 100,000 Americans dying as a result of overdose in 2021 alone, the highest number on record.[130]

Widespread vaccine and testing availability and growing treatment options are signs of a new phase of the pandemic. There is no longer need for daily or weekly press conferences to announce new social-distancing measures, nor blockbuster federal legislation to jump-start the economy. In contrast to the early months of 2020, clinicians and researchers have a much greater understanding of the nature of the virus, including modes of transmission, infection rates, and efficacy of mitigation measures. In addition, the state has multiple tools for testing, treatment, and prevention available. And while the early months of the pandemic saw record filings of unemployment claims in North Carolina, now the dominant economic concerns are labor shortages and inflation due to rapid growth.[131] Talent acquisition company Indeed reported in January 2022 that the Durham-Chapel Hill and Greensboro-High Point areas were in the top 10 metro areas with the fastest growth in job postings, boasting an increase of 90.7% and 70.5%, respectively, since February 2020.[132] Despite substantial epidemiological and economic progress since January 2020, uncertainty remains: whether another dangerous variant will emerge, whether and when economic recession will occur, when everything will feel "back to normal," and what changes brought about by COVID-19 will be integrated into that new normal. This report steps into that uncertainty, providing direction for critical initiatives to shore up our state's foundational capabilities and capacity for response, based on the experiences and thoughtful deliberations of the members of the Carolinas Pandemic Preparedness Task Force.

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